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| 09/820,463 | 03/28/2001 | Srinivas Nemani | 4778/DD/LOW K/JW | 5650 |

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| EXAMINER | |
|---|---|
| RAO, SHRINIVAS H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2814 | |

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/820,463 | NEMANI ET AL. | |
| | Examiner | Art Unit | |
| | Steven H. Rao | 2814 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *13 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,4-24 and 74-109* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,4-24, 74-109* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

### *Response to Amendment*

Applicants' amendment filed on October04, 2004 has been entered on October 13, 2004.

Therefore claims 1,4-24 and 74-109 as recited in the amendment are currently pending in the Application.

### *Claim Rejections - 35 USC § 103*

The following ù a quotation of 35 U.S.C. I03(a) which forms .the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,4 -10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaing et al. ( U.S. Patent no. U52002/0068458 A1 herein after Chiang) in view of Jiang et al. ( U.S. Patent No. 2002/0081855 A1, herein after Jiang).

With respect to claim 1 Chaing describes a method of thin film deposition for integrated circuit fabrication, comprising: providing a substrate; ( Chaing abstract line 2, etc.) treating the substrate with a plasma prior to forming a organosilicate layer, ( Chiang para 0012) .

With respect to claim 6 Chaing describes the method of claim 5, wherein the RF power is within a range of about 1 watts/cmz to about 100 watts/cmz. ( rejected for same reasons as et out previously) .

Re claim 7 The method of claim 1, wherein the reaction chamber is maintained at a pressure within a range of about 1 Torr to about 10 5ow. ( see rejection mailed on 4/7/2003)

Re claim 8 The method of claim 1, wherein the plasma treatment is performed at a temperature within a range of about 50 @C to about 400 @C. ( see rejection mailed on 4/7/2003)

Re claim 9 The method of claim 1, wherein the oxygen (ozl/hydrogen (H2) gases are provided to the reaction chamber at flow rates within a range of about 500 sccm to about 5,000 sccm. ( see rejection Oiled on 4/7/2003)

Re claim l0 The method of claim 4, wherein the at least one gas is provided to the reaction chamber at flow rates within a range of about 500 sccm to about 5,000 sccm. ( see rejection mailed on 4//2003).

**B.** Claims 1 1-24 and 74 -109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaing et al. ( U.S. Patent no. U52002/0068458 A1 herein after Chiang) and Jiang et al. ( U.S. Patent No. 2002/0081855 A1, herein after Jiang) as applied to claims 1, 4-10 above and fudher in view of Vincent et al. ( U.S. pre grant publication No. 2002/0142579 A1, hefein after Vincent) .

With respect to claim 6 Caing describes the method of claim 5, wherein the RF power is within a range of about 1 wattlcmz to about 100 watts/cmz. ( rejcted for same reasons as set out previously) .

Re claim 7 The method of claim 1, wherein the reaction chamber is maintained at

a pressure within a range of about 1 Torr to about 10 5ow. ( see rejection mailed on 4/7/2003)

Re claim 8 The method of claim 1, wherein the plasma treatment is performed at a temperature within a range of about 50 @C to about 400 @C. ( see rejection mailed on 4/7/2003)

Re claim 9 The method of claim 1, wherein the oxygen (ozl/hydrogen (H2) gases are provided to the reaction chamber at fow rates within a range of about 500 sccm to about 5,000 sccm. ( see rejection Oiled on 4/7/2003)

Re claim 10 The method of claim 4, wherein the at least one gas is provided to the reaction chamber at flow rates within a range of about 500 sccm to about 5,000 sccm. ( see rejection mailed on 4//2003).

**B.** Claims 1 1-24 and 74 -109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaing et al. ( U.S. Patent no. U52002/0068458 Ai herein after Chiang) and Jiang et al. ( U.S. Patent No. 2002/0081855 A1, herein after Jiang) as applied to claims 1, 4-10 above and fudher in view of Vincent et al. ( U.S. pre grant publication No. 2002/0142579 A1, hefein after Vincent) .

With respect to claims 11 and 74-76 Chaing and Jiang describe the method of claim 1, wherein the organosilicate layer is formed by: positioning the substrate in a deposition chamber, providing a second gas mixture to the deposition chamber ( Chaing abstract line 2 etc.).

Chinag and Jaing do not specifically describe wherein the second gas mixture comprises a silicon source, a carbon source, and an oxygen source; and

applying an electric field to the second gas mixture in the deposition chamber to form the carbon-containing silicate layer on the substrate.

However Vincent in paras 0058 to 0060, 0066 and 0084 describes wherein the second gas mixture comprises a silicon source, a carbon source, and an oxygen source; and applying an electric field to the second gas mixture in the deposition chamber to form the carbon-containing silicate layer on the substrate to combine the desired mechanical and electrical properties that are paramount for integrating low k dielectric materials in integrated circuits and to include steps of forming organosilicate layer in combination with low dielectric constant film.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Vincent's steps of the second gas mixture comprising a silicon source, a carbon source, and an oxygen source; and applying an electric field to the second gas mixture in the deposition chamber to form the carbon-containing silicate layer on the substrate to combine the desired mechanical and electrical properties that are paramount for integrating low k dielectric materials in integrated circuits and to include steps of forming organosilicate layer in combination with low dielectric constant film. ( Vincent paras 0028-0029, etc.) .

Re claim 12 the method of claim 11, wherein the silicon source and the carbon source comprise an organosilane compound having the general formula SiaCbH,Od, where a has a range between 1 and 2, b has a range between 1 and 10, c has a range between 6 and 30, and d has a range between 0 and 6. ( see previous rejection)

Re claim 13.the method of claim 12, wherein the organosilane compound is selected from the group consisting of methylsilane (SICH6), dimethylsilane (SiC2He), trimethylsilane (SiC31-11o), t#tramethylsilarie -(SiC4H12), methoxysilane (SiCH60), dimethyldimethoxysilane (SiC41-1 120z), diethyldiethoxysilane (SiC8H1802)) (SiC81-1200z), dimethyldiethoxysilane (SiC61-1 160a), diethyldimethoxysilane (SiCGH160z), hexamethyidisiloxane (Si2C61-1180), bistmethylsilanolmethane (Si2C31-112), l,zbistmethylsilanolethane (Si2C4H14), and combinations thereof. ( see previous rejection , rejected for the same reasons).

Re Claim 14 the method of claim 31, wherein the oxygen source is selected from the group consisting of nitrous oxide (N20), oxygen (02), ozone (03), carbon monoxide (CO), carbon dioxide (C02), and combinations thereof. ( Mncent para 0031).

Re Claim 15.the method of claim 11, wherein the electric field applied to the second gas mixture in the deposition chamber is provided by a radio frequency (RF) power. ( Vincent para 0084). Re Claim 16 the method of claim 15, wherein the RF power is within a range of about 1 watt/cmz to about 500 watts/cmz.t Vincent Table 4).

Re Claim 17 the method of claim 1 1 , wherein the deposition chamber is maintained at a pressure between 1 Torr to about 500 Torr.( Vincent para 00701).

Re Claim 18 the method of claim 12, wherein the organosilane compound is provided to the deposition chamber at a flow rate in a range of about 50 sccm to about 1,000 sccm. (Vincent para 0070).

Re Claim 19 t he method of claim 11, wherein the oxygen source is provided to

the deposition chamber at a flow rate in a range of about 10 sccm to about 200 sccm. .(Vincent para 0068).

Re Cliam 20 the method of claim 12, wherein the ratio of the oxygen source to the organosilane compound is about 1:1 to about 1:5. ( ( Vincent para 0062).

Re Claim 21the method of claim 11, wherein the deposition chamber is maintained at a temperature between about 50 @C to about 500 QC. ( Vincent table 4).

Re Claim 22 the method of claim 1 1 , wherein the second gas mixture further comprises an inert gas. ( Vincent Table 4).

Re Claim 23.the method of claim 22, wherein the inert gas is selected from the group consisting of helium (Me), argon (Ar), neon (Ne), xenon (Xe), and combinations thereof. ( Vincent table 4).

Re Claim 24.the method of claim 22, wherein the ined gas is provided to the deposition chamber at a flow fate in a range of about 10 sccm to about 1,000 sccm. ( Vincent Table 4).

(Claims 74-76 have been rejected along with claim 11 above).

Re claim 77. The method of claim 76, wherein the electric field is provided by a radio frequency (RF) power. ( rejected for reasons stated under claim 5 above).

Re claim 78. The method of claim 77, wherein the RF power is within a range of about 1 wattslcmz to about 500 wattslcmz. ( rejected for reasons stated under claim 6 above).

Re claim 79. The method of claim 78, wherein the reaction chamber is

maintained at a pressure within a range of about 1 Torr to about 10 Torr. (rejected for reasons stated under claim 7 above).

Re claim 80. The method of claim 74, wherein the plasma treatment is performed at a temperature within a range of about 50 @C to about 400 QC. (rejected for reasons stated under claim 8 above).

Re claim 81 the method of claim 74, wherein the molecular oxygen (02) and molecular hydrogen (H2) gases are provided to the reaction chamber at flow rates within a range from about 500 scan to about 5,000 sccm. (rejected for reasons stated under claim 9 above).

Re claim 82 the method of claim 76, wherein the at least one gas is provided to the reaction chamber with a flow rate at a range from about 500 sccm to about 5,000 sccm. (rejected for reasons stated under claim 9 above).

Re claim 83 the method of claim 74, wherein the silicon source and the carbon source comprise an organosilane compound having the general formula SiaCbHcOd, where a has a range between 1 and 2, b has a range between 1 and 10, c has a range between 6 and 30 and d has a range between 0 and 6. (rejected for reasons stated under claim 12 above).

Re claim 84 the method of claim 83, wherein the orgarlosifane compound is selected from the group consisting of methylsilane (SiCHs), dimethylsilane (SIC21hie), trimethylsilane (SiC3H1o), tetramethylsilane (SiC4H12), methoxysilane (SiCH60), dimethyldimethoxysilane (SiC4H1202), diethyldiethoxysilane (SiC8H1602), dimethyldiethoxysifane (SiC6H1602), diethyldimethoxysilane (SiCr,H1602)

,hexamethyldisiloxane (SizC61-118O), bistmethylsilanolmethane (Si2C31112), l,zbistmethylsilanolethane (Si2C4H14) and combinations thereof. (rejected for reasons stated under claim 13 above).

Re claim 85 the method of claim 84, wherein the oxygen source is selected from the group consisting of nitrous oxide (N2O), oxygen (02), ozone (03), carbon monoxide (CO), carbon dioxide (CO2) and combinations thereof. (rejected for reasons stated under claim 13 above),

Re claim 86 the method of claim 74, wherein the second electric field applied to the gas mixture in the deposition chamber is provided by a radio frequency (RF) power.(rejected for reasons stated under claims 5 and 77 above).

Re claim 87 the method of claim 86, wherein the RF power is within a range from about 1 watts/cmz to about 100 watts/cmz. (rejected for reasons stated under claims 6 and 78 above).

Re claim 88 the method of claim 87, wherein the deposition chamber is maintained at a pressure between about 1 Torr to about 10 Torr. (rejected for reasons stated under claims 7 and 79 above).

Re claim 89 the method of claim 83, wherein the organosilane compound is provided to the deposition chamber at a flow rate in a range of about 50 sccm to about 1 ,000 sccm. (rejected for reasons stated under claims 9 and 81 above).

Re claim 90 the method of claim 85, wherein the oxygen source is provided to the deposition chamber at a flow rate in a range of about 10 sccm to about 200 sccm. (rejected for reasons stated under daims 9 and 81 above).

Re claim 91 the method of claim 90, wherein the ratio of the oxygen source to the organosilane compound is about 1:1 to about 1:5. (rejected for reasons stated under claims above).

Re claim 92 the method of claim 74, wherein the second gas mixture further comprises an inert gas. (rejected for reasons stated under claims 22 above).

Re claim 93 the method of claim 92, wherein the deposition chamber is maintained at a temperature between about 50 @C to about 500 @C . (rejected for reasons stated under claims 21 above).

Re claim 94 the method of claim 93, wherein the inert gas is selected from the group consisting of helium (He), argon (Ar), neon (Ne), xenon (Xe), and combinations thereof. (rejected for reasons stated under claims 23, etc. above).

Re daim 95 the method of claim 94, wherein the ined gas is provided to the deposition chamber at a flow rate in a range from about 10 sccm to about 1,000 sccm. ( rejected for reasons stated under claim 24 above).

Re claim 96 the method of thin film deposition of an organosilicate layer, comprising'. positioning a substrate in a deposition chamber; depositing the organosilicate layer from a gas mixture, wherein the gas mixture comprises a silicon source, a carbon source and an oxygen source; and treating the organosilicate layer with a plasma, wherein the plasma is generated by applying an electric field to a second gas mixture comprising molecular oxygen gas and molecular hydrogen gas. ( rejected for reasons stated under claim 1, etc. above).

Re claim 97 the method of claim 96, wherein the substrate is treated with the

plasma before deposition of the organosilicate layer. ( rejected for reasons stated under claim 11, etc. above).

Re claim 98 the method of claim 96, wherein the gas mixture fudher comprises at least one gas elected from the group consisting of helium (He), argon (Ar), nitrogen (N2) and combinations thereof. ( rejected for reasons stated under claim 11, etc. above).

Re claim 99 the method of claim 98, wherein the electric field is provided by a radio frequency (RF) power. ( rejected for reasons stated under claim 5, etc. above).

Re claim 100 the method of claim 99, wherein the RF power is within a range of about 1 watts/cm2 to about 500 watts/cm 2. ( rejected for reasons stated under claim 6, etc. above).

Re claim 101 the method of claim 98, wherein the reaction chamber is maintained at a pressure within a range of about 1 Torr to about 500 Torr. ( rejected for reasons stated under claims 7,17 etc. above).

Re claim 102 the method of claim 98, wherein the plasma treatment is performed at a temperature within a range of about 50 @C to about 400 @C. (rejected for reasons stated under claims 8, etc. above).

Re claim 103.the method of claim 96, wherein the molecular oxygen (02) and molecular hydrogen (Hz) gases are provided to the reaction chamber at flow rates within a range from about 500 sccm to about 5,000 sccm. (rejected for reasons stated under claims 9, etc. above).

Re claim 104 the method of claim 98, wherein the at least one gas is provided to the reaction chamber with a flow rate at a range from about 500 sccm to about 5,000 sccm. (rejected for reasons stated under claims 10, etc. above).

Re claim 105 the method of claim 96, wherein the silicon source and the carbon source comprise an organosilane compound having the general formula SacbHcod, where a has a range between 1 and 2, b has a range between 1 and 10, c has a range between 6 and 30 and d has a range between 0 and 6. (rejected for reasons stated under claims 12, etc. above).

Re claim 106 the method of claim 105, wherein the organosilane compound is selected from the group consisting of methylsilane (SiCH,3), dimethylsilane (SiC2HS), trimethylsilane (SiCsHlb), tetra methyl silane (SiC4Ht2), methoxysilane (SiCH60), dimethyidimethoxysilane (SiC4H1202), dieth/diethoxysilane (SiC8H2002). dimethyldiethoxysilane (SiCrH,602), dieth/dimethoxysilane (SiCE;H1sa2), hexamethyldisiloxane (Si2CeHd80), bistmethylsilanolmethane (Si2C3H12), bistmethylsilanolethane (Si2C4H,4) and combinations thereof. (rejected for reasons stated under claims 13, etc. above).

Re claim 107 the method of claim 105, wherein tie oxygen source is selected from the group consisting of nitrous oxide (N20), oxygen (02), ozone (03), carbon monoxide (CO), carbon dioxide (C02) and combinations thereof. (rejected for reasons stated under claims 14, etc. above).

Re claim 108 the method of claim 107, wherein the oxygen source is, provided to

the deposition chamber at a flow rate in a range of about 10 sccm to about 200 sccm. (rejected for reasons stated under claims - 19, etc. above).

Re claim 109 the method of claim 108, wherein the ratio of the oxygen source to the organosilane compound is about 1:1 to about 1 :5. (rejected for reasons stated under claims 20, etc. above).

***Response to Arguments***

Applicant's arguments filed October13, 2004 have been fully considered but they are not persuasive.

It is noted that Applicants' analysis is based impermissible piece meal attacks on individual references whereas the rejection is based on the combined teachings of Chaing and Jiang: and Chaing, Jiang and Vincent .

It is well settled law that, in response to Applicant's piecemeal analysis of the references, it has been held that one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references. In re Keller, 208 USPQ 871 (CCPA 1981).

Applicants' first contention that Examiner theorizes and attempts to stiochiometerically balance dissociation products of H2O2 plasma and errs in failing to recognize hydrogen peroxide always contains water , and further negates the declaration is not persuasive because contrary to the Applicants' contention that examiner must accept stated facts , the examiner is required to evaluate the Declaration and decide upon whether sufficient facts have been provided to over come the rejection ( MPEP 716, etc.) and herein after careful review the examiner concluded that the

declaration did not show sufficient objective evidence of nonobviousness because of its failure to consider basic relevant facts as to all the end products produced by the disassociation reaction was insufficient to further the declaration is not relevant to the issue of nonobviousness by its omissions.

Further it is very clear for the dissociation to be stichiometerically correct if H2 O forms (OH) (the first O molecule forms OH) and H, than to account for second O molecule (02) of the two molecules present in H2 Ops-it must form molecularoxmen (0) because following the logic (reaction) set out In the affidavit/deceleration the two H atoms are used in H molecule and OH radical and one of the O molecule is used in the OH radical leaving an O molecule by itself. (The first O molecule forms OH) i.e. forming both molecular (H) and molecular (0), (and additionally hydroxyl radical- not relevant for the present purposes) identical to the present claim recitations.

In fact the complete list of disassociated molecules would include the following : hydroxyl radicals ( OH) and hydrogen radicals ( H) and Oxygen radicals ( 0) .

Secondly Applicants' have conveniently left out the disassociation products of plasma treatment of H2 O which when dissociated will produce molecular oxygen (02) and molecular hydrogen (H2) identical to that recited in the present claims.

Therefore Chaing and Jiang alone or in combination teach/suggest all the presently recited limitations in claim 1.

Applicants' contention with respect to claims I -24 and 74-109 that the applied third reference Vincent ( 20020142579 A1) does not suggest applying an electric filed to

a mixture of molecular oxygen and molecular hydrogen is not persuasive because Vincent in para 0067 states :

> [0067] Energy is applied to the gaseous reagents to induce the gases to react and to form the film on the substrate. Such energy can be provided by, e.g., plasma, pulsed plasma, helicon plasma, high density plasma, inductively coupled plasma, and remote plasma methods. A secondary rf frequency source can be used to modify the plasma characteristics at the substrate surface.

and in para 0073 states :

> by RF power, typically 100-2000 watts, or thermal energy. The pressure during film deposition is typically from 1 to 20 torr. The flow rates of materials and power levels used are dictated by the desired deposition rate and will also affect the composition of the final film material.

The above clearly shows to one of ordinary skill in the art that in Vincet electric filed is applied to the mixture .

Further , the applied secondary reference Jiang in para 0013 teaches /suggests an electric filed to a mixture of molecular oxygen and molecular hydrogen and therefore it is not necessary for the third Vincent refernce to repeat the teachings already taught by the secondary reference.

Applicants' contention w.r.t claims 74 an 94 that Chaing , Jiang and Vincent do not teach/suggest Chiang and Jiang, alone or in combination, do not teach, show or suggest , " a method of thin film deposition of an organosilicate layer comprising positioning a substrate in a deposition chamber, providing a gas mixture to the deposition chamber, wherein the gas mixture comprises a silicon source, a carbon source and an oxygen source, applying an electric field to the gas mixture in the deposition chamber to form the organosilicate layer on the substrate and treating the organosilicate layer with a plasma, wherein the plasma is generated by applying a

second electric field to a second gas mixture comprising molecular oxygen gas and molecular hydrogen gas " is not persuasive because for reasons et out in the rejection above and the remarks above.

.Therefore all presently claims are rejected over the above applied art for reasons stated above.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571) 272-1718 . The examiner can normally be reached on 8.00 to 5.00.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Steven H. Rao

Patent Examiner

December 22, 2004.

HOWARD WEISS
PRIMARY EXAMINER